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November 26, 2006

To: Dahl Dalton Maintenance Engineering Dept.
IPSC – Intermountain Power Service Corp.
Delta, Utah Plant

From: Reed C. Finch Air Pollution Control Specialist
Finch Environmental, Inc.
Payson, Utah

Subject: Quick Lime storage silo bin vent inspection & recommendations report.

Equipment: Quick Lime bin vent dust collector – water treatment operations.

Dear Mr. Dalton,

The following is a brief summary of our findings and recommendations from the inspection of the bin vent on top of the quick lime bin at the water treatment facility.

FILTERS:

The inspection found the filters to look in fair to good condition. No moisture ridden dust cake was found on the filters. The lime dust that was adhered to the filters was dry and easily removed. The filters appeared to be singed or Teflon coated as there were no visible felt fibers exposed to the collection side of the filter media.

Visible inspection of the filters without removal cannot determine blinding of the media but the color and texture were pristine and in good condition showing no visible signs of breakdown, fatigue, blinding, or bleedthrough.

CLEANING SYSTEM:

The baghouse is a bottom load Pulse-Jet unit with 4 rows of bags and six bags per row for a total of 24 filters.

The unit is fixed with a timer board holding 4 outputs to a 4 solenoids associated with a diaphragm for each row.

The diaphragms are single internal diaphragm valves with 3/4" NPT pipe connections and 3/4" diameter pipe blowpipes. The cleaning energy provided by the 3/4" single diaphragms

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is minimal but by design should be properly relative to the induced draft created by the baghouse fan.

What is meant by this is that the cleaning energy must be sufficient to flex the filter and release the agglomerated dust cake from the bags and allow it to drop off and into the bin against the volume and velocity of induced draft displacement air created by the dust collector ID fan.

The cleaning system is small but would ordinarily be sufficient.

PROBLEM:

With the dust collector running, vacuum was created sufficient to pull the DC door closed and create a seal. It was very hard to pull it open.

When the transfer process was started however the positive pressure and volume were much greater than the vacuum created by the DC fan and the DC door was pushed open creating a very positive environment in the vessel and dust collector.

- a- The DC fan and collector appears to be undersized for the material transfer blower.
- b- Or, the blower is oversized for the designed bin vent dust collector.

The purpose of the bin vent is to alleviate transfer air while separating product from the gas stream. It should be sized to handle the CFM provided by the material blower and the grain load that it transfers.

CFM of air volume numbers for the DC fan and lime material blower were not provided during this inspection but it appears that the DC is not able to handle the volume of air and grain load.

Note: During inspection one of the first things noticed was that the bin vent housing was bulged as if it had seen a high positive pressure internally. These collectors are typically designed for 20" wg negative pressure. Positive pressures may affect the housing at lower pressures.

It may seem that the easy thing to do is to increase the size of the DC fan to keep the vessel negative during material transfer. This may not be the answer as increasing the vacuum volume may increase it above the air-to-cloth ratio design, can velocity design, and cleaning pressure design values. The result would be high dp's due to inability to release dust cake.

Changing collector volumes may or may not be a permitting issue as well on this unit.

In all cases the first thing that needs to be done is to find the volume of positive pressure and compare it to the DC negative design capabilities.

The dp gauge was not legible during this inspection but the airflow throughput through the filter media appeared to be good and the filters were breathing well.

A new 0-15" H₂O wc gauge is recommended to determine filter resistance during operation and cleaning.

SUMMARY:

Internally the dust was dry and easily removed from the filters. The filters are in good condition and appear to be sufficiently permeable.

The material transfer blower volume relative to air and possibly grain load appears to far exceed the dust collector and its associated fans ability to keep the vessel negative. It is not able to effectively alleviate the displaced air therefore the vessel is under a positive pressure creating dusting and poor operation.

It was also noted by the operator that the positive pressure effects the bottom discharge area of the silo and mixing area as the pressure pushes a large amount of lime from the bottom of the vessel under the positive pressure created during material transfer. It appears that this area and the top inspection hatch are the least paths of resistance and become the areas of venting the air not handled by the bin vent fan.

We appreciate the opportunity to serve you in this capacity. Please contact us with any questions or additional needs relative to this unit or any of your pollution control equipment.

Sincerely,

Reed C. Finch
Air Pollution Control Specialist
Finch Environmental, Inc.

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CAPITAL PROJECT JUSTIFICATION 2008-2009

JOB.NO:

IGS08-XX

W.O. #07-19854-0

TITLE:

Replace water treatment quick lime hopper dust collector 2

DESCRIPTION:

New dust collector will be a pulse jet clean on demand cleaning system. The filtration system will be raw edge top disc bottom load with PTFE Teflon on acrylic filter bags. The dust collector is sized with a 2000 CFM exhaust fan and a 3.8:1 air-to-cloth ratio to meet regulation requirements.

JUSTIFICATION:

REGULATORY REQUIREMENT

REGULATION:

State Regulation: R307-201.3(2)

Title V Operating Permit: Condition II.B.9.a, Condition II.B.1.c

Approval Order: Condition 11.B, Condition 21,

NONCOMPLIANCE:

Possible violation of operating permit and fines imposed based on daily occurrences

MEANS OF COMPLIANCE:

Re-size dust collector to properly handle the air volume from the transfer blower

DEADLINE FOR COMPLIANCE:

None

ADDITIONAL DETAIL:

The current dust collector when started up with out the transfer blower on will create a vacuum on the quick lime hopper as desired. When the transfer blower is turned on and material starts to enter the quick lime hopper the hopper becomes pressurized pushing dust out of the relief vent in the top of the hopper and lime into the slakers plugging them.

Testing of the airflow of the exhaust fan VS. the transfer blower showed that the blower puts out approximately 1175 - 1225 CFM and the fan approximately 1150 - 1200 CFM. The differential pressure at the time of the test was 1.5 inches of water. This is optimal operating condition. The CFM of the fan will go down as the dust cake builds on the bags causing a higher differential pressure. This makes it impossible for the dust collector to ever pull a vacuum while the transfer blower is running. This shows that the exhaust fan on the dust collector is under sized.

The lime hopper dust collector operating permit is base on emissions of grains/ tons. If only the fan size is increased then the air to cloth ratio changes causing the grains/ tons

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CAPITAL PROJECT JUSTIFICATION 2008-2009

emission to go up. This will require us to reopen the operating permit. If the bag house is increased proportionally to the fan increase the air to cloth ratio will not change keeping the emission the same. This will allow us to operate to the same permit we currently have.

COST ESTIMATE:

	08-09
Engineering Labor	\$ 4,000
Installation Labor	\$ 11,000
Contractor Labor	\$ 8,600
Material	\$ 27,000
Job Total	\$ 50,600

ALTERNATIVES:

Decrease the CFM of the transfer blower. Continue to operate in violation to operating permit.

EFFECT OF DEFERRAL:

Lime transfer line could become plugged. Could be fined by OSHA and/or the DAQ.

PROJECT HISTORY:

See above